REMARKS

Examiner is thanked for the Official Action of May 17, 2004 and the Advisory Action of August 4, 2004. This request for continued examination is intended to be fully responsive thereto.

CLAIM OBJECTIONS

Claims 4 and 5 were objected to because of informalities. Claim 4 was cancelled and the limitations were incorporated into claim 1. Claim 5 was canceled and the language of claim 5 was also incorporated into claim 1. Therefore, the amendments above satisfy the examiner's objections as to claims 4 and 5.

REJECTION UNDER 35 U.S.C. 112 FIRST PARAGRAPH

Claims 34 and 54 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement.

The Examiner states that the limitation in claim 34, "wherein at least one layer of electrode material is coated with an ion-conducting polymer" does not appear to be in the original disclosure. Therefore, Claim 34 has been amended to read "wherein electrode material is coated with an ion-conducting polymer" in conformance with the Examiner's recommendation.

Also, the limitation in claim 54, "wherein the amount of binder used in said first electrode layer is greater than the amount of binder used in said second electrode layer" does not appear to be in the original disclosure. Claim 54 has been amended to read "the percentage by weight of binder used in said electrode layer is greater than the percentage by weight of binder used in said second electrode layer". Therefore, the examiner is respectfully solicited to withdraw the rejection under the first paragraph of 35 U.S.C. 112.

REJECTION UNDER 35 U.S.C. 112 SECOND PARAGRAPH

Claims 1, 4-6, 34, and 54-56 were rejected under 35 U.S.C. 112, second paragraph, as failing to particularly point out and distinctly claim the subject matter

which applicant regards as the invention.

The limitation in claim 1, "thereby attaining effective adhesive properties and low electrical resistance of said electrode" is indefinite because the term "said electrodes" lacks antecedent basis within the claim. Claim 1 has been amended to recite "said first electrode layer" instead of "said electrode".

The limitation in claim 34, "at least one layer of electrode material" shows insufficient antecedent basis. As already discussed above, claim 34 has been amended to read "electrode material is coated with an ion-conducting polymer".

The limitation in claim 54, "wherein the amount of binder used in said first electrode layer is greater than the amount of binder used in said second electrode layer" is indefinite. As already discussed above, claim 54 has been amended to read "the percentage by weight of binder used in said electrode layer is greater than the percentage by weight of binder used in said second electrode layer".

Therefore, the examiner is respectfully solicited to withdraw the rejection under the second paragraph of 35 U.S.C. 112.

REJECTIONS UNDER 35 U.S.C. 102

Claims 1, 4, 34, 54 and 55 were rejected under 35 U.S.C. 102(b) as being anticipated by the JPO machine translation for JP 11-67214A to Osawa et al.

Based on the Applicant's experience and knowledge in the field of art, Applicant asserts that Osawa was used incorrectly by the Examiner for the following reasons. The examiner stated that Osawa et al. discloses the use of polyvinylidene fluoride to improve the adhesion of the first electrode layer to the current collector (see paragraph 7 of machine translation). Since polyvinylidene fluoride has a higher adhesive strength than polyaniline, the first electrode layer would have a stronger adhesive strength than the second electrode layer relative to the current collector resulting in an electrode structure having effective adhesive properties. Furthermore, the first electrode layer has low electrical resistance (see paragraph 9 of machine translation) and use of a conductive polymer as a binder in the second electrode layer would give low electrical resistance to the electrode structure.

In Osawa et al., paragraph 7 of the machine translation states that "...consists of a polyvinylidene fluoride...since the adhesion of a positive-electrode charge collector and an active material can be improved by using a fluorine system...as a binder..." However, polyvinylidene fluoride is known to be a less-adhesive material. For example, the present application explained that the binder polymer, that easily forms fibrils, binds poorly to the current-collecting material and as such has poor bonding strength and therefore such binder polymer is used in layers other than the first electrode layer.

It is a well-known fact in the industry that polyvinylidene fluoride is a less-adhesive material, and in order to show and prove this the applicant conducted experimentation and discloses the results herein and as appeared in the sworn statement attached hereto. In this experiment, a first electrode layer was formed by polyvinylidene fluoride while a second electrode layer was formed by Teflon.

The applicant used JIS 4.15 of D0202 where it states that a cellotape is placed and adhered on an object (e.g., electrode layer formed on a surface of the current collector); an end of the cellotape is picked up so as to make a right angle between an adhesive surface of the cellotape and the surface of the object; and the cellotape was peeled off instantly.

As shown in the two photocopies attached hereto, it is clear that the polyvinylidene fluoride of Osawa et al. shows less adhesiveness than that of the present invention as described in Sample 3 of the current specification (i.e., layers comprising of ion-conducting polymer first layer and Teflon second layer). The examiner is invited to view these photos and to compare them with FIG. 9 of the present invention. Two photos, i.e., (X) cellotape on which the peeled electrode is adhered and (Y) electrode after being peeled off, are similar to (C) in FIG. 9 of the present invention where the electrode layer has been completely peeled off from the current collector (rank "c"). See FIG. 9(C) and lines 5-7 of page 21.

This sworn statement clearly shows that polyvinylidene fluoride in fact tends to form fibrils and adheres poorly to the current collector and thus, has poor adhesive strength. Therefore, polyvinylidene fluoride is not a preferable material to

be used on the first layer if employed in the present invention. A material that could easily fibril should and must be used on the second layer. This is a clear structural difference from Osawa et al and the present invention. The Examiner stated in the advisory action of 08/04/2004 that Osawa discloses polyvinylidene fluoride in the first electrode layer that is used to improve the adhesion of the first electrode layer to the current collector which would result in the first electrode layer having effective adhesive properties to the current collector. This is, as has been explained, incorrect because if Osawa uses the polyvinylidene fluoride the first electrode layer will Not be more adhesive than the second layer, as is shown in the present invention. Therefore, it appears to the Applicant that Osawa is not, as stated by the Examiner, an anticipatory reference.

The Examiner also notes in the Advisory Action that applicant's comparison of the adhesive strength of the electrode layer containing polyvinylidene fluoride as disclosed in the JP11-67214 A reference with the adhesive strength of the electrode layer containing the ion conducting polymer binder in the specification is irrelevant because the specific ion conducting polymer binder has not been claimed.

On the other hand, the Applicant disagrees with the Examiner's statement that "the polyvinylidene fluoride binder in the first layer inherently becomes gelled when exposed to the nonaqueous electrolyte solution and the gelled polyvinylindene fluoride binder inherently is ion-conducting." See a paragraph on page 5 starting with "[i]nstead of a polymer electrolyte gel..." of office action dated May 17, 2004. The examiner explained that the statement is based on the machine translation of JP11-67214. However, apparently major mistranslation exists in the machine translation and the correct translation of the last 3 sentences in the paragraph 22 of JP11-67214 should be:

> "A negative-electrode solution is prepared by dissolving and mixing polyvinylidene fluoride 8.5 weight part, artificial graphite (mean particle diameter of 3 micronmeters) 3 weight part and natural graphite (mean partile diameter of 2 micrometers) 88 weight part as carbon materials, oxalic acid 0.5 weight part, and N-methyl pyrrolidone 50 weight part, and then the negative-electrode solution was coated on copper foil (10 micrometers in thickness) by blades to form a electrode layer with a thickness of 90

micrometers). The same items in Embodiment 1 were tested. The result appeared in Table 1 was obtained accordingly."

Here, the polyvinylindene fluoride is used as a binder (NOT ION-CONDUCTING MATERIAL).

Because of the structural differences between the present invention and the cited references, any rejection regarding claims 1, 6, 34, 54, and 56 are improper. Further, new claim 57 is dependent from claim 1 and therefore would be allowable if claim 1 is allowable. Therefore, it is respectfully submitted that claims 1, 6, 34, 54, and 56-57 are now in condition for allowance and notice to that effect is requested.

REJECTIONS UNDER 35 U.S.C. 102

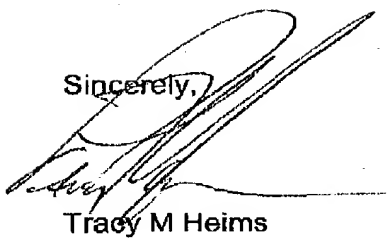
Claims 5, 6, and 56 were rejected under 35 U.S.C. 102(b) as being anticipated by the JPO machine translation for Osawa et al. However, claims 5 and 6 were canceled by the above amendment and claim 56 is distinguished from Osawa et al. because of the above argument and reasoning.

CONCLUSION

Because of the structural differences between the present invention and the cited references, any rejection regarding claims 1, 6, 34, 54, and 56 are improper. Further, new claim 57 is dependent from claim 1 and therefore would be allowable if claim 1 is allowable. Therefore, it is respectfully submitted that claims, 1, 6, 34, 54, and 56-57 are now in condition for allowance and notice to that effect is respectfully requested.

Should the examiner believe further discussion regarding the above claim language would expedite prosecution they are invited to contact the undersigned at the number listed below.

Sincerely,



Tracy M Heims

Apex Juris, pllc
13194 Edgewater Lane Northeast
Seattle, Washington 98125
Phone: (206) 664-0314
Fax: (206) 664-0329
Email: tracy@apexjuris.com